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Governor

STATE OF WASHINGTON
DEPARTMENT OF SOCIAL AND HEALTH SERVICES
1409 Smith Tower, B17-9 • Seattle, Washington 98104

ALAN J. GIBBS
Secretary

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Joel Mulder
Toxic Waste Management
215 Fremont
San Francisco, CA 94105

Dear Joel:

The recently announced NESHAPS for arsenic have sparked a lively debate over the ability of health effects studies to detect arsenic-induced lung cancer among Tacoma residents. Because the sensitivity of such studies has not been examined relative to the model of excess risk, postulated by the EPA, the continuing debate is based on personal opinions. As you might imagine, the opinions of the various officials differ on this matter.

An alternative to this debate is to statistically examine the sensitivity of the existing studies. I am requesting funding for such an analysis which will further our understanding of the limits of detection for an excess lung cancer risk among Tacoma area residents.

In a recent public meeting in Tacoma, the EPA announced that four additional lung cancer deaths are expected each year in the Tacoma area from ASARCO arsenic emissions. With a background level of 270 lung cancer deaths each year in the impact area, this increase would almost certainly go undetected. However, a closer inspection of the EPA model suggests effects on sub-populations which may be detectable. For example, the model postulates no interactive effect of arsenic exposure and smoking. Thus, almost three of the four excess lung cancer deaths would be among non-smokers (assuming 33% of the population smokes). Since lung cancer among non-smokers is extremely rare (only 17 deaths per 100,000 people, age 35-84, per year), an increase of three deaths per year may be detectable.

Although we do not know which lung cancer deaths were related to smoking, we know that women have not, until recently, consumed their fair share of cigarettes. Consequently, they have not suffered much lung cancer. Between 1950 and 1970, only 146 Tacoma women died of lung cancer (6.8 deaths per year). Since half of the postulated excess lung cancer deaths, according to the EPA model, would occur among women, and since women are also less likely to have confounding occupational exposures, this group would provide a sensitive test to detect arsenic-induced lung cancer.

For the years 1950 to 1970, a DSHS study examined lung cancer by census tract for Tacoma. I propose to examine the ability of this historical lung cancer mortality study to detect an excess number of community lung cancer cases. We will statistically test whether .5, 1, 1.5, etc., additional female lung cancer cases can be detected given the expected number of cases for the time period and population at risk. The analysis would require the following data:

1) the coding of 199 female lung cancer deaths (which occurred between 1970 and 1975) in Pierce County to census tract. Lung cancer deaths are already coded by DSHS to census tract for the period 1950 to 1970.

2) the pattern of arsenic exposure by census tract (obtained from the EPA). This will allow us to calculate what fraction percent of the postulated excess deaths occur in each census tract.

3) urban-female age-specific lung cancer mortality rates for 1950, 1960, 1970 and 1980 for the U.S.

4) census data for females for 1950, 1960, 1970 and 1980 by age (ages 35-84) and by census tract for Pierce County.

I believe the above analysis would go a long way toward resolving the issue of the ability of health studies to detect an excess of lung cancer in Tacoma. Attached is a budget covering the costs of conducting the analysis outlined above. I appreciate your efforts in exploring funding sources for such a study.

Sincerely,

Floyd Frost

Floyd Frost, Ph.D.
Chronic Disease Epidemiologist

FF:bl

Enclosure

cc: John Beare, M.D.
Samuel Milham, Jr., M.D.
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